

**Stormwater Management Watershed Assessment
for the Tributary to the South River
Marshfield, Massachusetts**

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Application

APPLICATION
COASTAL POLLUTION REMEDIATION PROGRAM – FY 2004

The application must contain clear and concise narrative responses (and supporting graphics, maps, or tables as necessary) to each of the following 7 sections. Section 8 calls for supporting information.

Project Type: Assessment

Name/Address of Applicant: Town of Marshfield
Town Hall
870 Moraine Street
Marshfield, MA 02050

Participating Municipalities: Town of Marshfield

Project Title: Stormwater Management Watershed Assessment
for Tributary to the South River in the Town of
Marshfield, Massachusetts

Project Manager: Mr. Jay Wennemer, Conservation Administrator
Phone: 781-834-5573
Fax: 781-837-7163
e-mail: wennemer@townofmarshfield.org

Amount Requested: \$37,500

Match Amount: \$15,140

Total Project Cost: \$52,640

Project Summary:

The objective of this project is to develop a comprehensive assessment study to identify sources of pollution and define remedial actions to control stormwater runoff for a 440-acre watershed draining to an unnamed tributary to the South River in Marshfield, Massachusetts (see Figure 1). The Town of Marshfield, the Marshfield Stormwater Working Group¹, the North and South Rivers Watershed Association (NSRWA), and the environmental consulting firm of Horsley & Witten will collaborate in the development of the assessment to recommend

¹ Current members of the Marshfield Stormwater Working Group include: Jay Wennemer (Marshfield Conservation Administrator), Greg Robbins (Marshfield Dept. Public Works), Joan Kyler (Marshfield Conservation Commission), Jack Kyler (Marshfield Planning Board), Samantha Woods (NSRWA Executive Director), Wendy Garpow (Massachusetts Bays Program), and Jason Burtner (MA Coastal Zone Management). The Group intends to expand participation to include other stakeholders as this proposed project is implemented.

appropriate BMPs and lead an effort to develop remediation plans at least to a 25% design level. If successful, it is the intent of the applicant to apply to the CPR program in FY05 (or other funding source) to implement the designs created through this FY04 grant.

Remediating stormwater impacts and pollution from this subwatershed is part of a larger objective of the Town of Marshfield and the NSRWA to reduce fecal coliform levels at shellfish growing areas to allow the bed to be continuously open. The subwatershed targeted in this proposal is believed to be a significant pollutant contributor to the South River as it drains untreated stormwater from Mass Highway and town roads, and warrants a full assessment before BMP recommendations.

Stormwater pollution mitigation is one part of a larger effort to improve water quality in the South River. The river is listed on the DEP 303 (d) list of impaired waterways for pathogens, and there are significant portions of the shellfish growing area that are listed as "prohibited" by the Massachusetts Department of Marine Fisheries (DMF). Recently the town began extending centralized wastewater treatment to major portions of the lower South River. It is anticipated that this proposed project, coupled with other pollution remediation projects in the watershed, will significantly improve water quality in the South River as well as protect, enhance, and restore sensitive coastal resources such as shellfish beds.

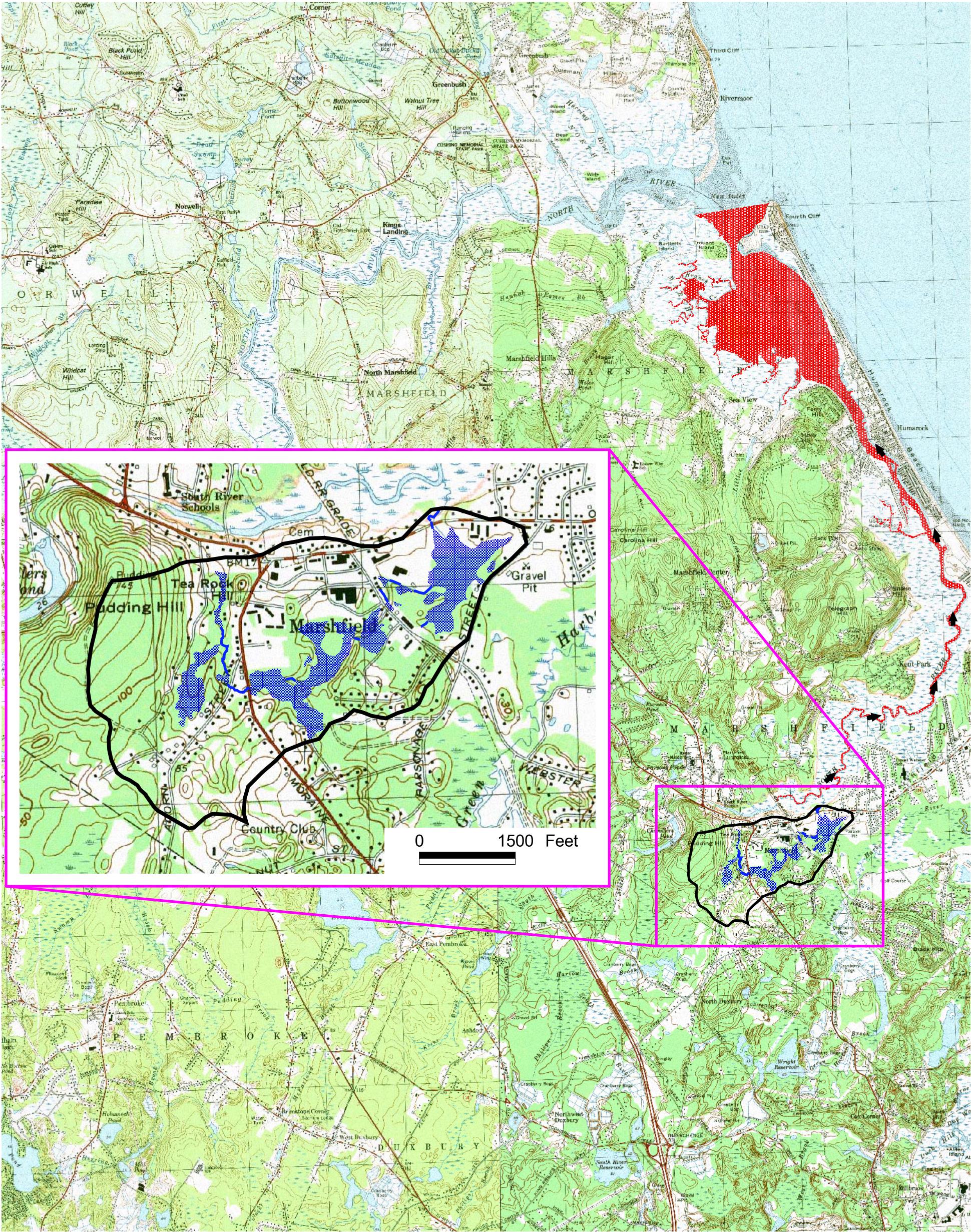
Components of this project will support future TMDL implementation efforts by reducing pollutant loadings to the South River, which is on the Massachusetts 303 (d) list of impaired waters for pathogens, as well as meet objectives of the Phase II stormwater permit program for the Town of Marshfield.

This project will address the following goals:

- Minimize stormwater pollution delivery to downstream contaminated shellfish beds, complementing the Commonwealth's initiative to clean shellfish beds and open them for commercial and recreational use;
- Target a shellfish bed, eel grass beds, and anadromous fish habitat; and
- Complement other programs and/or leverage other funds for the control, prevention, and abatement of non-point source pollution.

1. Describe the Pollution Problem:

What is the pollutant(s) of concern and what is the source? What information is available to substantiate the pollution problem. Provide supporting material such as water quality data from the receiving waters, and basic site drainage information including: approximate size of immediate drainage area which flows to the discharge point; % of impervious surfaces in the drainage area;



Legend



Subwatershed



Wetlands



Streams



Designated Shellfish Growing Area
Department of Fisheries, Wildlife and Environmental
Law Enforcement's Division of Marine Fisheries, 2000



0 4000 Feet



Horsley & Witten, Inc.
phone: 508-833-6600
www.horsleywitten.com

South River Subwatershed and Designated
Shellfish Growing Area Locus

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south_river_gis\impervious.apr

Figure 1

approximation of runoff amount to be treated (state standards recommend ½ " to 1 "). Provide a clear and legible map that shows drainage area, surrounding land uses, and the location of existing drainage structures.

The South River is located primarily within the Town of Marshfield, Massachusetts and drains an area of approximately 24 square miles. The river flows eastward from its headwaters in Duxbury through the Town of Marshfield almost to the ocean, then turning to the north behind the Humarock barrier beach and proceeding to its confluence with the North River. Approximately 4.6 to nearly 7 miles of the over 12-mile length of the South River is subject to tidal influence (Connor, 1997). Land use within the watershed includes a variety of residential lots (nearly all on private septic systems), commercial and institutional uses, as well as woodland fragments and wetland corridors associated with the tributaries and the river itself. Wetlands of the South River provide valuable flood storage, filtering of pollutants, and terrestrial and aquatic habitat.

Approximately 450 acres of historic shellfish growing area at the mouth of the South River has been closed and classified as "prohibited" since May of 1989 (Churchill, 1994). It is a stated goal of the North and South Rivers Watershed Association (NSRWA) to reduce fecal coliform bacteria levels at the shellfish beds to the extent necessary to allow continuous opening of the beds for harvest (NSRWA, 1993). The NSRWA has successfully worked with municipalities and state agencies to address similar challenges in the North River. In 1990, nearly 200 acres of shellfish beds were closed due to poor water quality. The NSRWA collaborated with project partners for six years to clean up pollution hot spots along the North River, and in 1996 the shellfish beds were re-opened. The NSRWA is now focusing their efforts on the South River.

Extensive widespread urbanization of the watershed has led to the construction of a variety of storm drainage systems that discharge to the South River. Most of these were constructed prior to the implementation of the Massachusetts Stormwater Management Policy (DEP/CZM, 1997) and consequently little or no stormwater management treatment exists within the watershed. In addition, nearly all watershed development is serviced by on-site sewage disposal systems. Poorly functioning on-site wastewater disposal was identified as a probable source of fecal coliform in the watershed throughout the monitoring record (see below and NSRWA, 1993). Centralized sewage treatment is currently underway in Marshfield Center with the recent extension of a sewer main to service the commercial district and accompanying adjacent residential areas. As of the writing of this grant proposal, only the eastern most portion of the system has been accepted by the Town, with the remainder scheduled for completion and hook-up by the end of the year.

NSRWA staff and volunteers, in conjunction with the Massachusetts Department of Environmental Protection (DEP), has collected water quality samples since the early 1970's. The majority of historic samples were collected along the mainstem and major tributaries of the South River itself. Parameters sampled include fecal coliform bacteria, total phosphorus, nitrate nitrogen, organic nitrogen, ammonia nitrogen, chlorides, pH,

alkalinity, biochemical oxygen demand (BOD₅), dissolved oxygen (DO), and suspended solids (Conner, 1997; see excerpts under Appendix A).

A 1993 study, "Storm Water Investigations Relating to the South River," prepared by NSRWA and Fugro East, Inc. (now ENSR) looked at storm drainage outfall pipes in an attempt to isolate fecal coliform source areas. The sampling program initially looked at 42 outfall locations, and collected 44 dry weather and 7 wet weather samples (one dry weather sample at each site, with 2 sites sampled twice; 7 of the 42 outfall locations were revisited during a single wet weather event). The wet weather sampling was too insignificant to yield meaningful results, however dry weather sampling results suggested illicit connections, infiltration, and poorly functioning septic systems as probable sources of fecal coliform delivery to the river.

The 1993 study also involved a more detailed investigation at 15 specific locations within the lower watershed (see Appendix B, excerpts from the 1993 NSRWA study). Samples were collected during and immediately after a one-inch rainfall event at each of the 15 sites, but apparently the sampling was conducted over the term of the storm with varying intensities and flows reported at the different locations. The results were difficult for the authors to interpret, likely because they were from just one storm and taken over the term of the event. Yet the authors did identify 3 locations with higher fecal coliform loadings, but qualified their decision due to sampling uncertainty.

Five of the 15 locations were ultimately chosen for even more intensive study. Four additional samples were collected at each site, one during dry weather, and 3 during and after a larger storm (1.9" precipitation over two days). The authors concluded that dry weather concentrations at all five locations were low to moderate, but "increased dramatically during wet weather sampling." This wet weather sampling event yielded fecal coliform concentrations ranging from a low of 240 col/100 mL to a high of 570,000 col/100 mL, with the most significant number occurring during the later stages of the storm and immediately after the conclusion of the event. Many of the samples were in the 10,000-to 40,000 col/100 mL range. The resulting concentrations, while 2 to 4 orders of magnitude above the shellfish harvesting standard (14 col/100 mL) and 1 to 3 orders of magnitude above the contact recreation standard of (200 col/100 mL), are well within the range of the median of urban stormwater runoff concentrations at the 15,000 col/100 mL level (Schueler, 2000).

A careful review of the 1993 study and sampling results, as well as a review of historic sampling data suggests that there is no single obvious "smoking gun" in the quest for the most significant pollutant sources within the watershed. Instead, it appears that during dry weather, there are isolated issues at several locations associated with poorly functioning septic systems, illicit connections, and natural sources (e.g., geese, raccoons, etc). During wet weather, it is likely that elevated concentrations of fecal coliform will be common throughout the watershed. Common wet weather sources include washoff and rapid transport from sanitary sewer overflows, hobby farms, pet wastes, as well as poorly functioning septic systems, illicit connections, and natural sources.

Of all the potential locations to investigate for stormwater pollution remediation, the most logical subwatershed appears to be the unnamed tributary draining Marshfield Center (see Figure 1). This subwatershed was selected for this grant proposal based on the following factors and considerations:

- The unnamed tributary to the South River was included in the 1993 study, but site selection criteria, sampling frequency, and project budget constraints, did not specifically isolate the subwatershed for further investigations;
- The subwatershed encompasses much of downtown Marshfield Center where stormwater runoff volumes and loadings will be significantly elevated as a function of higher impervious cover;
- Untreated stormwater runoff from State and Town-owned roads drains to this unnamed tributary to the South River;
- The subwatershed is located immediately upstream from closed designated shellfish growing areas where pollutants, particularly fecal coliform, contribute to water quality impairment. The South River is listed on the 1998 303(d) list of impaired waters for pathogens from Main Street in Marshfield to the confluence with the North River;
- The 440-acre area, with approximately 15% impervious cover, contains among the more intensive land uses in the lower South River watershed (see Figure 2 for land use distribution within the subwatershed and a subwatershed impervious cover estimate);
- A recent reconnaissance survey through the subwatershed revealed several opportunities for stormwater runoff remediation including the discharge location of a major drainage system in the downtown center of Marshfield (see Figure 3);
- The subwatershed is now being partially sewered and connected to a centralized wastewater treatment system. This will address one significant source of water quality impairment and provide a unique opportunity to show dramatic improvement by addressing remaining non-point sources; and
- The subwatershed is located in a busy commercial center where public outreach and education efforts can be readily implemented through a variety of means (e.g., signage, informational flyers in retail outlets, "green business" campaigns, etc.).
- The Town of Marshfield is working on an economic revitalization project for Marshfield Center that is ongoing and any stormwater management remediation will complement these efforts.

2. Describe the natural resources and related human uses that are impaired by the pollutant discharge:

Describe how pollutant(s) of concern listed in question #1 impact important natural resources and recreational uses. Provide information on resource classifications, relevant management issues, and any status reports conducted on the resources/uses that are impaired. Maps showing the location of resources and/or classification areas that also show location of discharge are recommended.

As previously mentioned, The South River from Main Street in Marshfield to the confluence with the North River is listed for pathogens on the DEP's 303(d) list of impaired waterways, and is a priority site for the NSRWA as a shellfish bed restoration area. The South River is ecologically productive as it is home to several species of shellfish (including blue mussels, soft-shelled clams, and quahogs – Churchill, 1994), numerous bird populations, anadromous fish runs, and eel grass beds.

An example of how bacteria and pathogens are affecting the natural resources of the South River is evidenced by the closure and seasonal restriction of productive shellfish beds all along the lower reaches of the river. In 1994, DMF reaffirmed the "prohibited" status of the river (see Appendix C, for a copy of the relevant sections of this study).

The South River also contains anadromous fish habitat and is therefore a priority for DMF. Appendix D contains written documentation from DMF for the South River as a viable anadromous fishery for alewives, smelt, and shad.

3. Describe the Project Details:

Assessment: Funding is available to municipalities for assessment work to identify potential source(s) of pollution and design pollution remediation solutions. Describe the proposed assessment plan designed to address the cited pollution problem. Please refer to the "Assessment Funding" section of the RFR for further details regarding this portion of the application.

The goal of this project is to position the Town of Marshfield for implementation of stormwater BMPs to reduce fecal coliform bacteria contamination and nutrient loading into the South River. The Town of Marshfield will contract the engineering and environmental services firm of Horsley & Witten (of Sandwich, Massachusetts) to work with the, Department of Public Works and project partners to complete a comprehensive assessment of the subwatershed (identified in Figure 1) and create preliminary designs for BMP implementation. This assessment will include the following seven components and tasks:

1. Delineate Drainage Area

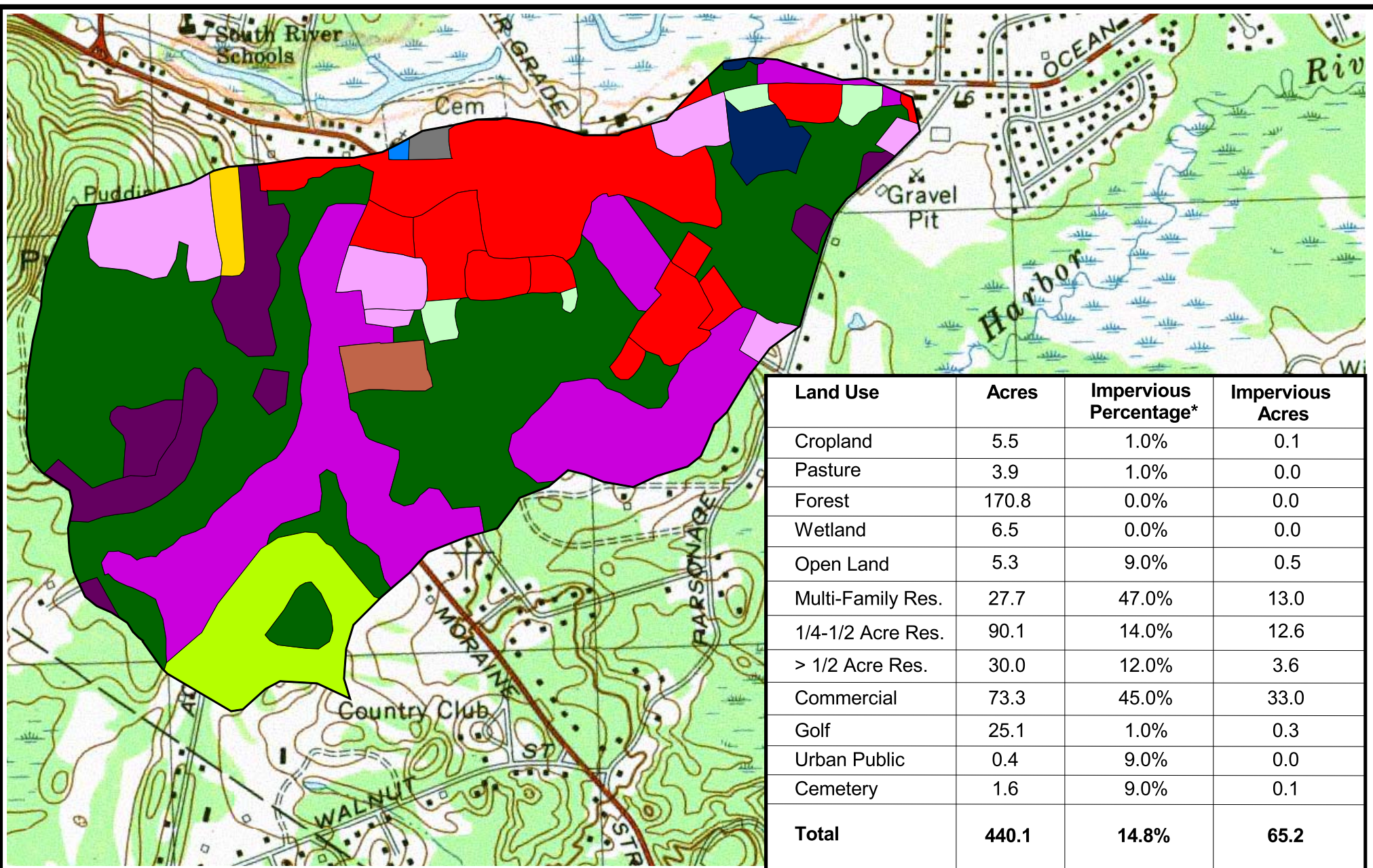
Lead: Horsley & Witten

Horsley & Witten will conduct a preliminary field survey to identify the boundaries of the subwatershed and the extent of the existing stormdrain system, including subdrainage areas and locations for potential dry and wet weather sampling.













2. Stormdrain Investigation and Mapping

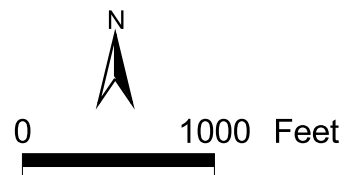
Lead: Horsley & Witten

Horsley & Witten will digitize the subwatershed stormdrain system location and related information provided by the Town so that information can be stored and used in GIS. The stormdrain information that will be incorporated into the GIS



Legend

	Cropland		Open Land		Commercial
	Pasture		Multi-Family		Golf
	Forest		1/4-1/2 Acre Residential		Urban Public
	Wetland		> 1/2 Acre Residential		Cemetery



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Subwatershed Land Use Profile
and Impervious Surface Calculations

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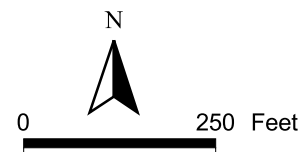
Figure 2

* Studies from Holliston, MA and the Chesapeake Bay area were used to apply impervious coefficients (Cappiella et al., 2001).



Legend

- | | | |
|---|---|--|
| ■ Catch Basin | ■ Wetlands | — 12-inch Stormdrain Pipe |
| ● DMH | □ Drainage Area | — 18-inch Stormdrain Pipe |
| ● Inlet | | — 24-inch Stormdrain Pipe |
| ● Outfall | | — 30-inch Stormdrain Pipe |



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phone: 508-833-6600
www.horsleywitten.com

Map of Downtown
Stormdrain Infrastructure
Marshfield, MA

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South_River_GIS\Locus.apr

Figure 3

data layer is expected to include location, size, material, invert elevation (where known), and conditions of all catch basins, stormdrain pipes and outfalls in the system. The GIS data layer will be created using MassGIS as a base, and will provide the Town with spatial location information and a linked data table of the related information listed above. In addition to serving as the foundation for this assessment, Tasks 1 and 2 will aid in meeting the Town's NPDES Stormwater Phase II future permit requirements.

3. Water Quality Sampling

Lead: NSRWA and Town of Marshfield

The water quality sampling program is a key component to the investigation of pollutant sources within a subwatershed. Sampling of appropriate parameters, including fecal coliform and nitrate nitrogen, at strategic locations within the drainage area and at strategic points in time will help to narrow down and ultimately identify the most likely sources of those pollutants. Water quality concentrations found during wet weather sampling will be compared with expected concentrations in stormwater from national databases for the land uses within the contributing drainage area. The utility of the water quality sampling program results is largely dependent on a proper sampling design that captures a snapshot of the drainage area at various critical times. This type of investigative sampling program differs from a long-term monitoring program, which serves to evaluate change in quality over time.

As part of the grant match, the Town, assisted by NSRWA staff and volunteers, will identify and take water quality samples in several locations throughout the subwatershed. It is anticipated that approximately 6 sampling locations will be investigated with samples taken weekly over the course of six weeks in dry and wet weather. The goal of this sampling plan is to identify pollutant hotspots within the drainage area. The methodology for volunteer monitoring and sampling collection shall conform with the Quality Assurance Project Plan (QAPP) approved by the U.S. EPA on January 21, 1999 for the South River.

4. Soil Investigations

Lead: Horsley & Witten

The implementation of many stormwater BMPs requires information about the soil profile and percolation rate at the site. In order to assess whether or not a site may be an appropriate location for a particular BMP, Horsley & Witten will perform soil test pits and percolation tests at a maximum of 10 locations within the drainage area of the selected subwatershed to the South River. Horsley & Witten will work with the Town to identify appropriate locations for these tests.

Soil investigations will include soil percolation rate at depths of three feet and six feet below the surface (the approximate depths at which various infiltration BMPs may be installed or constructed), depth to groundwater, depth to bedrock, and soil classification. In areas where the depth to bedrock or depth to water is less than 36 inches, it will be assumed that an infiltration BMP cannot function properly at

the site and the remainder of the testing at that site will be aborted. A full suite of information, as described above, will be collected from a maximum of ten sites.

As part of the grant match, the Town will utilize town-owned equipment to excavate test pits and restore the site after testing.

5. Identify Areas to Site BMPs and Identify Appropriate BMP Systems

Lead: Horsley & Witten

Stormwater management options are usually grouped into one of two broad categories, as so-called “structural” management measures and/or as “non-structural” measures. For purposes of discussion, structural measures are those that consist of a physical device or practice that is installed to capture and treat stormwater runoff. These include a wide variety of practices and devices, from large-scale retention ponds and constructed wetlands, to small-scale underground treatment devices.

Based on the results of Tasks 1 through 4, Horsley & Witten will work with Town and NSRWA to analyze the data and determine the most appropriate and effective stormwater management strategies to achieve the project objectives. Horsley & Witten will conduct an inventory of potential stormwater management facility locations within the 440-acre subwatershed. This inventory will include both an office and field component to identify potential candidate sites for stormwater retrofit facilities. The approach will first utilize the MassGIS data as amended under Task 2 to identify preliminary candidate stormwater control locations. Potential sites will then be screened in the field to determine technical, political, and permit feasibility. A conceptual sketch will be prepared for all feasible sites. BMPs are typically sized to capture and treat stormwater runoff from ½" to 1" over the watershed. However, because the subwatershed drains to a "critical area," BMPs will be evaluated to attempt to capture and treat 1" of runoff from impervious surfaces. Horsley & Witten will provide a summary report to the Town and NSRWA for review. The summary will include: preliminary stormwater treatment/management capability, planning level cost of each site, and a ranking of the feasible sites based on a cost/benefit analysis.

Finally, Horsley & Witten will work in collaboration with the Town and NSRWA to select a suite of preferred sites for stormwater BMPs. Criteria for selection of preferred sites will include performance standards, siting criteria, pollutant removal effectiveness, estimated costs, potential permit requirements, potential conflicts with utilities, and potential non-technical constraints, such as impacts on nearby residents and land owners, aesthetics, or conflicts surrounding proposed activities on the site.

6. Community Information Workshop

Lead: Horsley & Witten

Horsley & Witten will develop and conduct a public information workshop for the community about stormwater impacts and best management practices. This workshop will be informal, and will follow an agenda agreed upon with the Town and NSRWA. It will include general presentations about stormwater, stormwater impacts, and methods to manage stormwater, as well as a question and answer session. This type of workshop can be very beneficial in easing tensions and gathering neighborhood support when BMPs are implemented in the future. In addition, this type of public education will aid in meeting the Town's NPDES Stormwater Phase II future permit requirements.

As part of the grant match, the Town, assisted by NSRWA staff, will help facilitate the discussions, provide appropriate meeting space, and assist with workshop logistics.

7. Prepare preliminary BMP design and Final Assessment Report

Task 7a. Conduct Field Survey and Base Plan Preparation

Lead: Town of Marshfield

A licensed surveyor (Town of Marshfield) will conduct selective field surveys, as necessary, of the preferred sites to ensure accuracy of the 25% design drawings. Depending on the characteristics of the preferred sites, field surveys may include topographic detail or bathymetry (if necessary) at isolated locations, utility/drainage locations and elevations, existing structures, selective tree locations, and property boundary information. In addition, the Horsley & Witten will delineate all resources areas, such as wetlands, within the limits of the preferred project sites. Horsley & Witten will also investigate whether or not the preferred project sites contain habitats that support any threatened or endangered species. The deliverable product from this task will be a set of base plans for use in producing the conceptual designs and a resource area assessment report suitable for future permitting and to help guide the conceptual design process.

As part of the grant match, the Town of Marshfield will provide field surveying for preferred sites as necessary to develop 25% design plans (see task 7b, below)

Task 7b. Develop Conceptual Designs for Preferred Alternatives

Lead: Horsley & Witten

Horsley & Witten will prepare conceptual designs for the preferred sites at a level of approximately 25% of final construction drawings. The conceptual designs will include plans showing the location, size, general layout of proposed stormwater management measures and include profiles and schematic details as necessary to fully describe the proposed projects. The conceptual design package will include hydrologic and hydraulic calculations to verify sizing. Preliminary

budgetary cost estimates and construction schedules will also be provided. The final deliverable from this task will be a report that incorporates the computations, plans, resource area delineations, cost estimates and construction schedule.

4. **Submit an Operation and Maintenance Plan:**

*Describe the municipality's commitment to operation and maintenance of the proposed structure, including the anticipated maintenance schedule. Provide contact information for the individuals who will perform any required maintenance. Also describe how the operation and maintenance will be funded. A letter from the municipal Public Works Department committing to operation and maintenance is **required** (see required supporting materials in sections 7).*

The Town of Marshfield is requesting CPR funding for assessment only, therefore this section is Not Applicable.

5. **Budget – Grant Funds Requested:**

*Provide an **itemized** budget breakdown for only the funds being requested (75% of the total project cost) by category (i.e. materials and supplies, contractual, etc.). Any work already completed, prior to the signing of a contract between the municipality and the state cannot be considered for reimbursement.*

Funds cannot be requested for Operation and Maintenance. Please be aware that excellent record-keeping will be important for reimbursement of funds should a grant be awarded.

Proposed Budget

Task	Estimated Cost (Contractual)
Task 1: Delineate Drainage Area	\$ 1,770
Task 2: Stormdrain Investigation and Mapping	\$ 2,960
Task 3: Water Quality Sampling	\$ 630
Task 4: Soils Investigations	\$ 2,080
Task 5: ID Areas to Site BMPs and ID Appropriate BMP Systems	\$ 9,100
Task 6: Community Information Workshop	\$ 2,900
Task 7a: Field Survey and Base Plan Preparation	\$ 600
Task 7b: Develop Conceptual Designs for Preferred Alternatives	\$ 14,160
Reimbursable expenses	\$ 3,300
Total	\$ 37,500

Grand Total (Grant Funds Requested): **\$37,500.00**

Grant Funds Requested are 71% of the project's cost: (Total Project Cost is \$52,640.00)

6. Budget – Proposed Match:

*Discuss all aspects of the municipalities match (25% of the **total project cost**), cash, in-kind or both. State or federal money that is not currently being used to match other government programs can be included as match. Costs incurred as result of application preparation will not be considered as part of the local match requirements.*

Cash contributions are those that will be used to purchase goods or services associated with the project. Cash match spending details must be provided or the cash match will not be considered as part of the local match requirements.

In-kind contributions represent the value of non-cash contributions provided by the applicant. In-kind contributions may be in the form of charges for real property and non-expendable personal property and the value of goods and services directly benefiting and specifically identifiable to the project. If the Professional Engineering Plans for the project have been completed and billed after June 30, 2003 and a valid receipt can be provided, this cost will be accepted as match. Any additional work at the site which is directly related to stormwater, as determined by the committee, for which the municipality can produce bills dated June 30, 2003 or later can also be applied to the match commitment. The applicant must supply documentation which shows that the match required for project completion can be secured through a signed acknowledgement from the authorized signatory of the municipality or draft town article (see section #8, Required Supporting Materials).

Cash: \$2,500 (for sampling equipment and field supplies, by NSRWA on loan to Town of Marshfield for the duration of the project – including 2 long arm horiz. flow samplers at \$225 each, 1 rainfall data logger at \$510, 1 multi-parameter probe for pH, DO, conductivity, and temperature at \$1,350, and miscellaneous supplies at \$190)

In-Kind:**Proposed Budget**

Task	Estimated Cost
Task 1: Delineate Drainage Area	\$ 0
Task 2: Stormdrain Investigation and Mapping	\$ 0
Task 3: Water Quality Sampling (8 samples at 6 sites = 48 samples) [labor to collect samples (3 hrs/sample at \$15/hr = \$2,160), laboratory analysis (\$20/FC sample & \$40/N sample = \$2,880), assessment of results (30 hrs at \$50/hr = \$1,500)]	\$ 6,540
Task 4: Soils Investigations (backhoe rental @ \$150/hr for 2.5 days)	\$ 3,000
Task 5: ID Areas to Site BMPs and ID Appropriate BMP Systems	\$ 0
Task 6: Community Information Workshop [room rental (\$200), notices (\$650), refreshments(\$150)]	\$ 1,000
Task 7a: Field Survey and Base Plan Preparation (3 days field crew at \$700/day)	\$ 2,100
Task 7b: Develop Conceptual Designs for Preferred Alternatives	\$ 0
Reimbursable expenses	\$ 0
Total	\$ 12,640

TOTAL Proposed Match (Cash and In-Kind): **\$15,140.00**

The proposed match is 29% of the Total Project Cost (Total Project Cost is \$52,640.00)

7. Public Interest:

Provide a detailed description of how the project will serve the public interest and how it is consistent with community wide needs and priorities.

The identification of pollutant sources and the development of a proposed remediation plan will serve the public interest by reducing potential health risks and exposure to pathogens, either by direct contact while swimming/kayaking or through eating contaminated shellfish. The reopening of long closed shellfish growing areas will help sustain the local economy and foster a better connection between the land the water. Implementation of stormwater management measures and introduction of watershed stewardship concepts to local residents of the South River watershed will help citizens understand that their own behavior and that of their neighbors can contribute to better water quality and a better environment and quality of life in their immediate community.

An improvement in water quality and wildlife habitat will support ongoing efforts by the Town of Marshfield to revitalize the downtown area of Marshfield Center.

References

- Cappiella, K. and K. Brown, 2001. Impervious Cover and Land Use in the Chesapeake Bay Watershed. Center for Watershed Protection. Ellicott City, Maryland
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Letters of Support

Statement of Qualifications

Horsley & Witten, Inc.

- Corporate Description
- Project Descriptions and References
 - Relevant Staff Resumes

CORPORATE DESCRIPTION

Horsley Witten Group is a small business, full-service environmental science and engineering firm with an office located in Sandwich (Cape Cod), Massachusetts. The firm was incorporated in 1988 and consists of a professional staff of fifty engineers, hydrogeologists, hydrologists, wetlands scientists, marine scientists, geologists, computer modelers, land use planners, environmental analysts, licensed site professionals and supporting personnel. Horsley Witten Group specializes in providing consulting services in coastal and watershed protection, hydrology, hydrogeology, engineering, land use planning, and technical information transfer and training. Our clients include government agencies at the federal, state, tribal, regional, county, and municipal levels, as well as private sector organizations, non-profit organizations and individuals.

Horsley Witten Group is an interdisciplinary environmental services firm combining engineering and science with land use planning, economics, and public policy. Our corporate goal is to create innovative solutions to environmental problems by successfully integrating engineering, scientific and management skills.

Horsley Witten Group is nationally recognized for its ability to translate results of water quality, engineering, hydrogeologic, and land use investigations into policies, regulations and management strategies that can be readily implemented at the federal, state, tribal and local government levels. The success realized in all of our US EPA and state level projects is a direct result of our knowledge of local and state regulatory issues and our understanding of the scientific and policy foundation behind these regulations.

Over the past twelve years, approximately two-thirds of our client base has been in the public sector covering the entire range of community, county, state, federal and tribal governments. Our work in the private sector has been primarily in site design and permitting.

Currently, Horsley Witten Group holds a prime contract with US EPA's Headquarters Office of Groundwater and Drinking Water, entitled "Technical Support for the Underground Injection Control (UIC), Drinking Water and Source Water Protection Programs."

Statement of Qualifications

Town of Marshfield

Standard Forms

Appendix A

**Excerpts from
“The South River: A Water Quality Summary Report
of Data Gathered from 1971- 1996”**

Appendix B

**Excerpts from
“Storm Water Investigations Relating to the South River”**

Appendix C

**Excerpts from
Massachusetts Department of Marine Fisheries “Preliminary Shoreline Survey
Report of South River in the Towns of Marshfield and Scituate”**

Appendix D

Brochures from Massachusetts Department of Marine Fisheries *As Evidence for the South River as Containing Anadromous Fish Habitat*